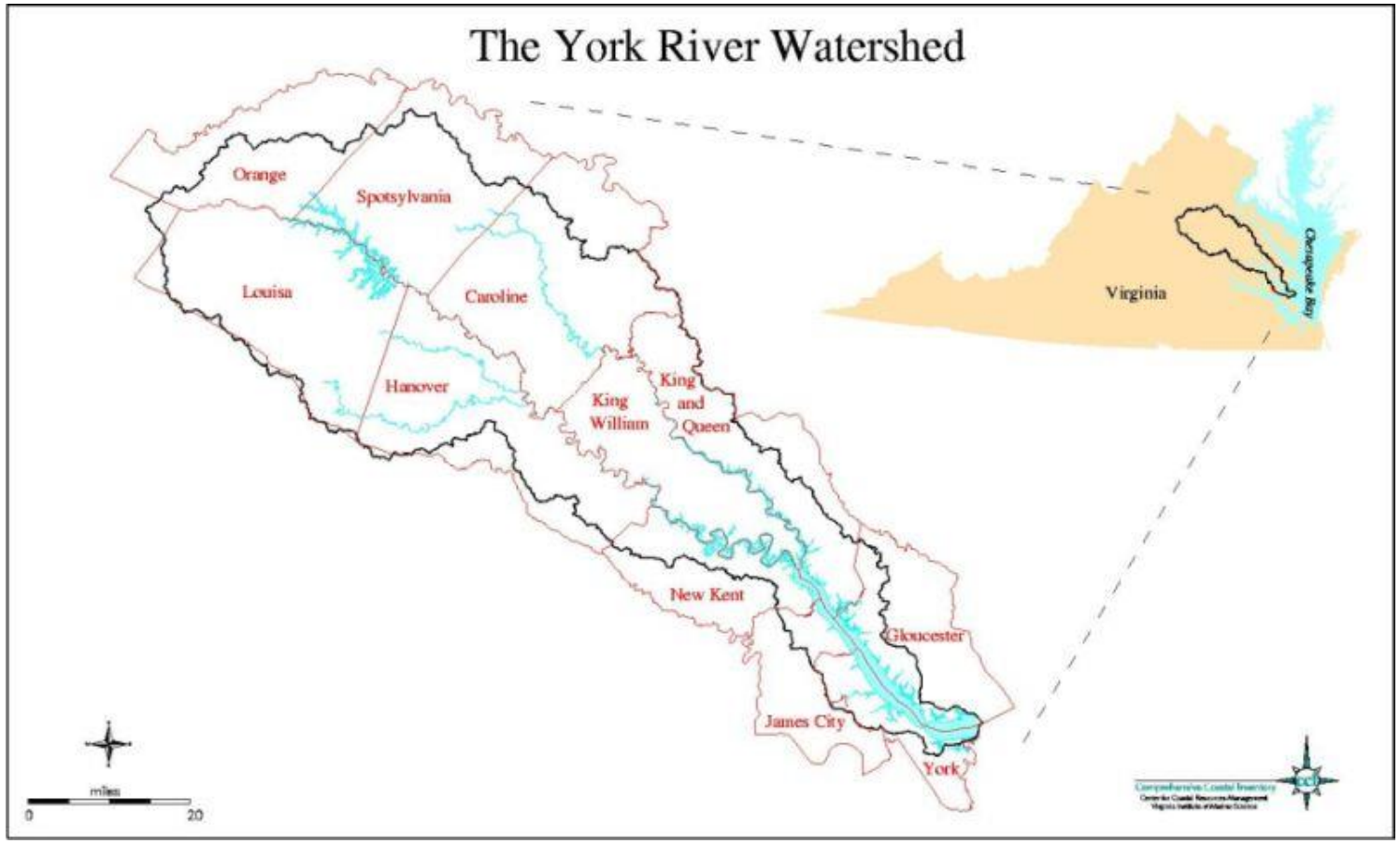
# Quantifying the relative effects of shorescape development on forage fish production in the York River subestuary, 2000 - 2016




Funded by: Chesapeake Bay Trust

Scope #2: Establishing a Shoreline Condition Metric or Threshold

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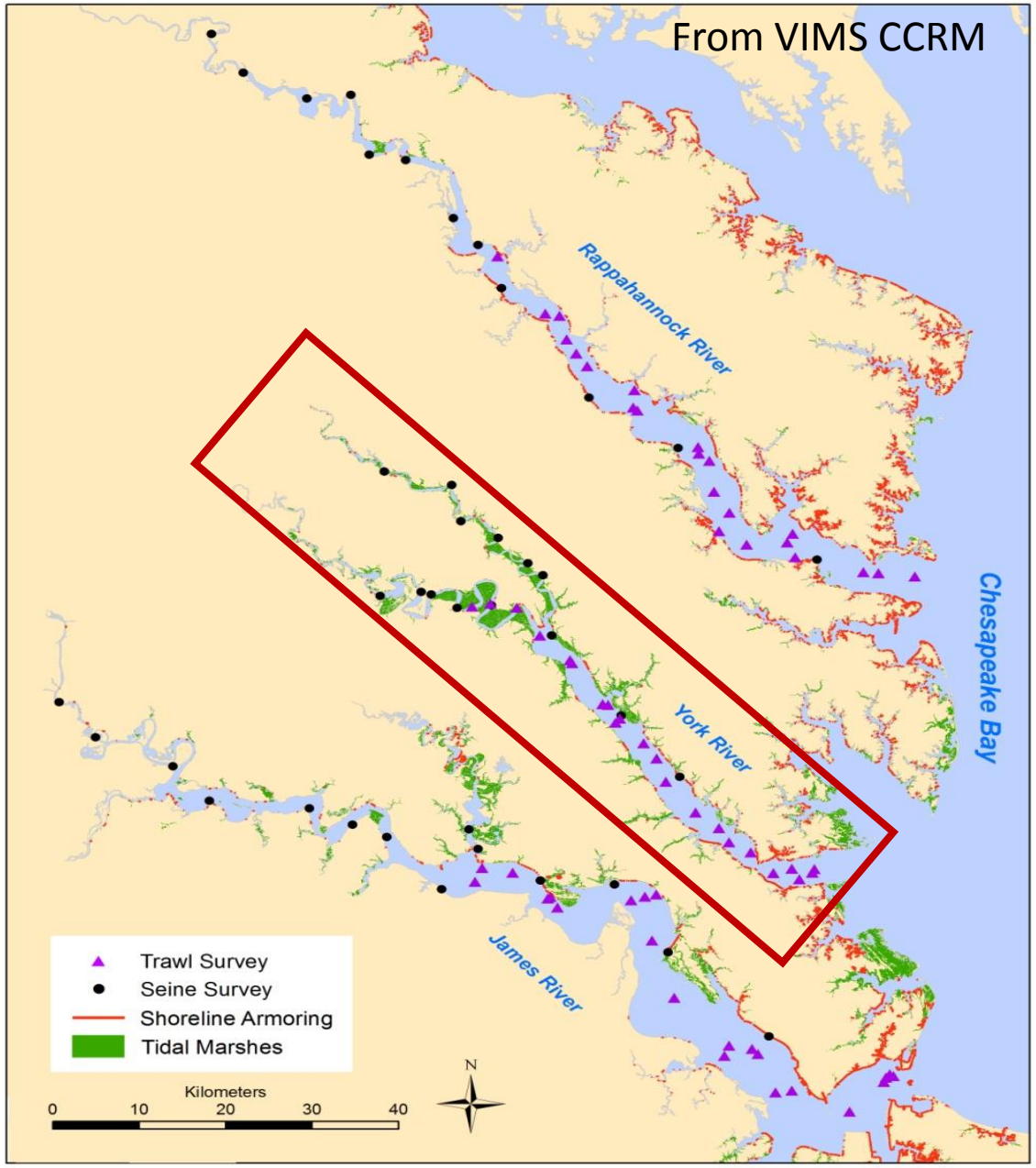
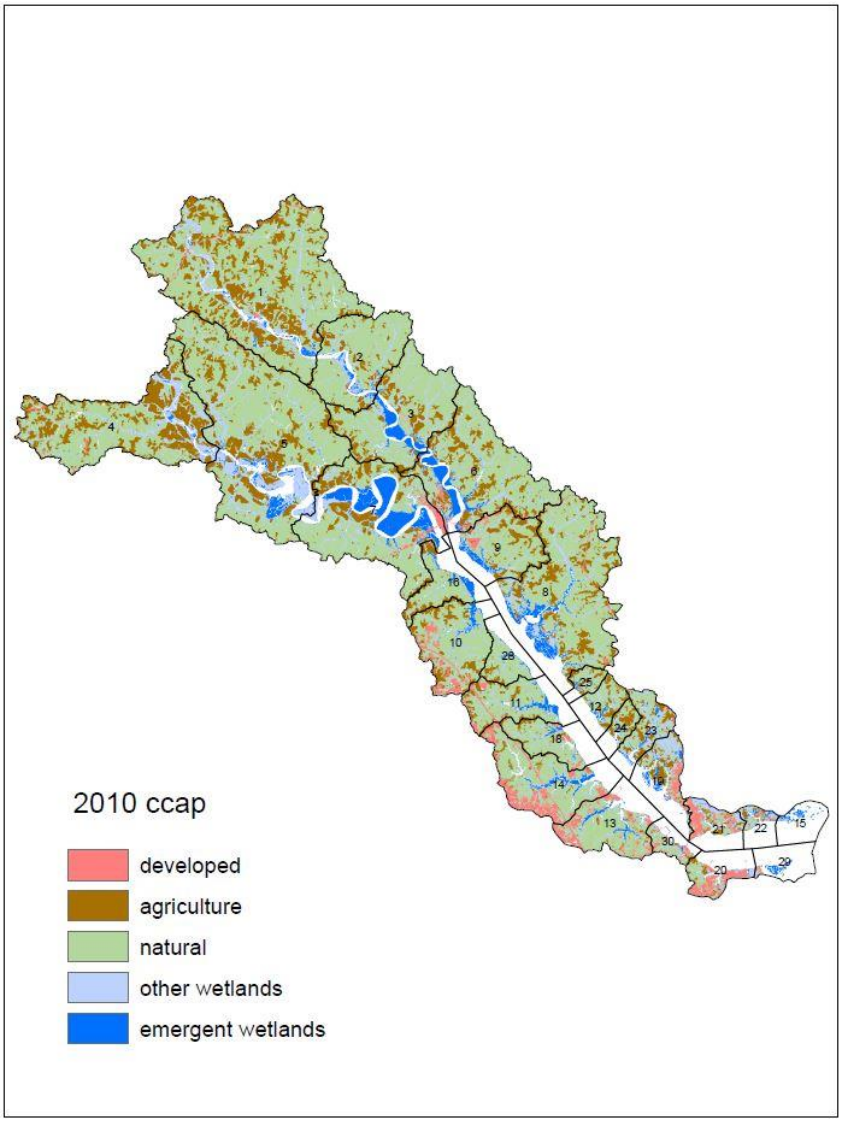
# Objectives - A temporal perspective

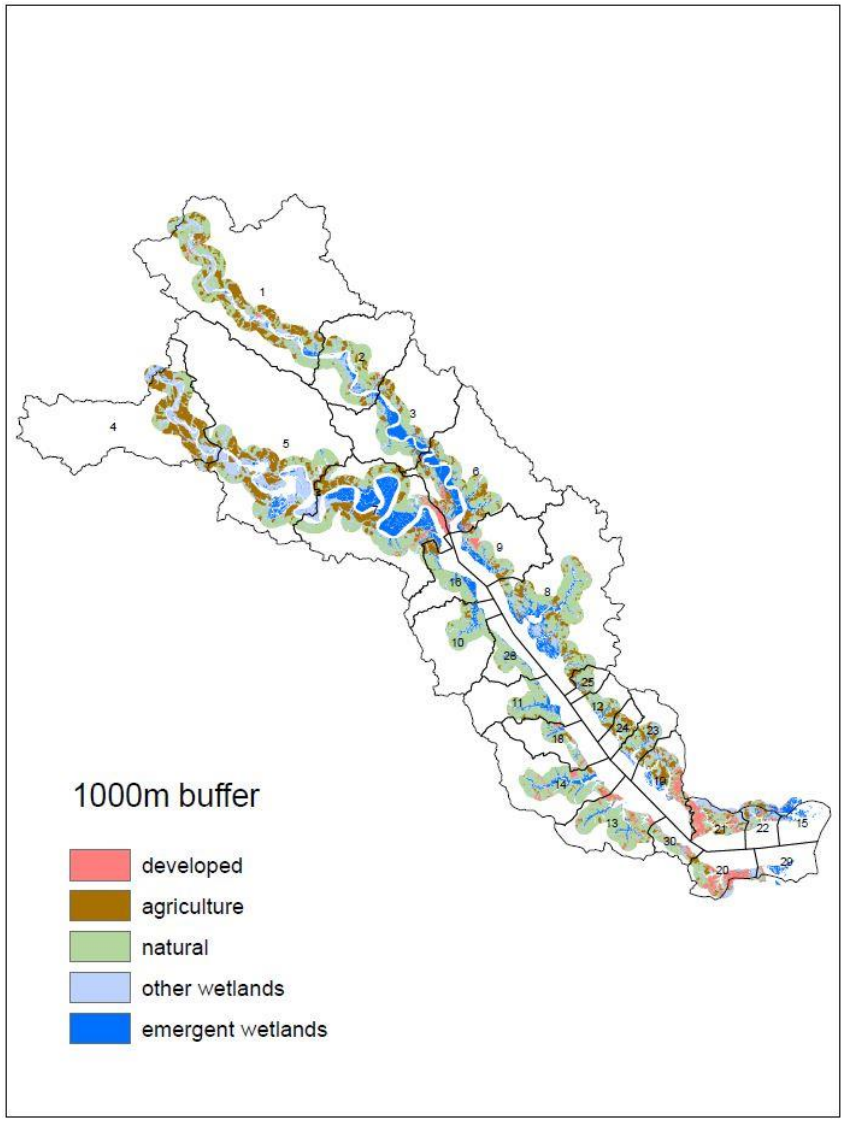
- Develop metrics of upland/shorescape condition to evaluate the effects of armored shorescapes and land use on forage species using relative abundance, size, and community composition as measures of forage quality.
- Identify threshold values of the shorescape metrics above which forage quality is compromised.
- Compare outcomes of this study approach with those of Seitz et al.

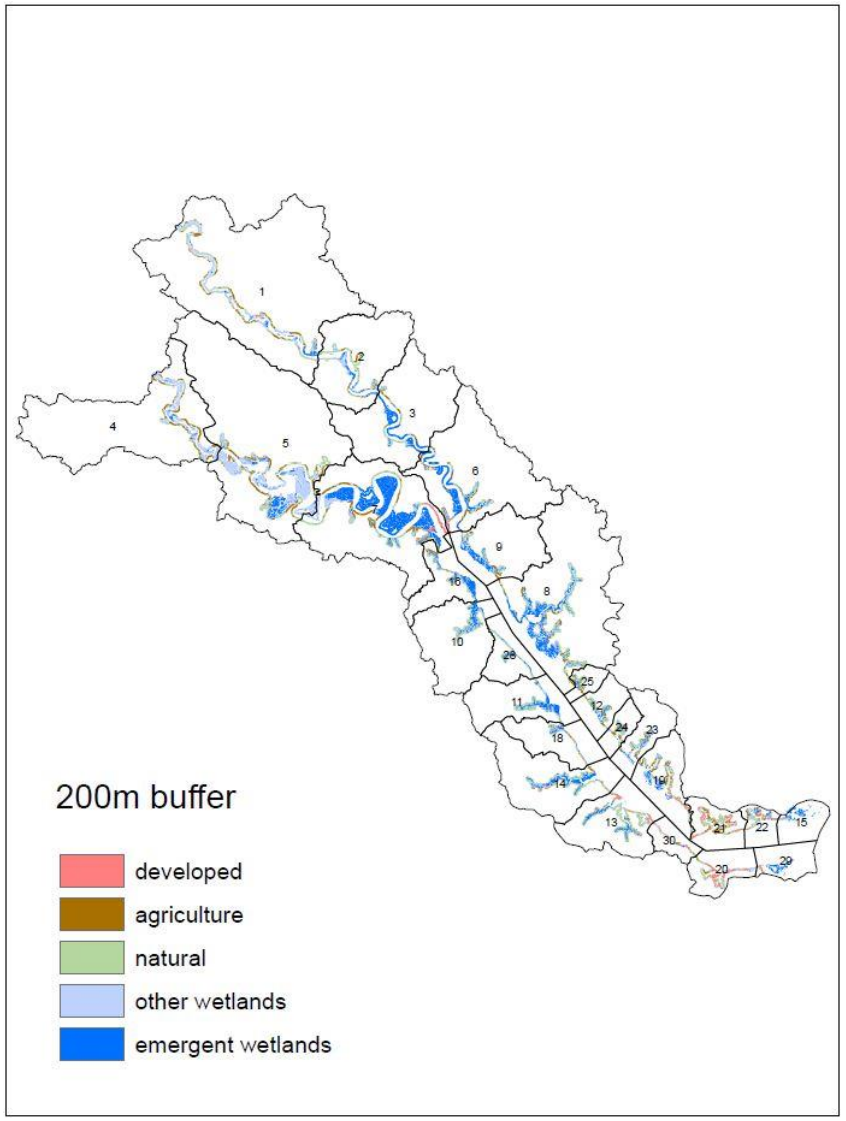


# Data sources:

- NOAA's Coastal Change Analysis Program (C-CAP 1992, 2001, 2010) – Characterize landscape features (e.g., % developed, % agriculture)

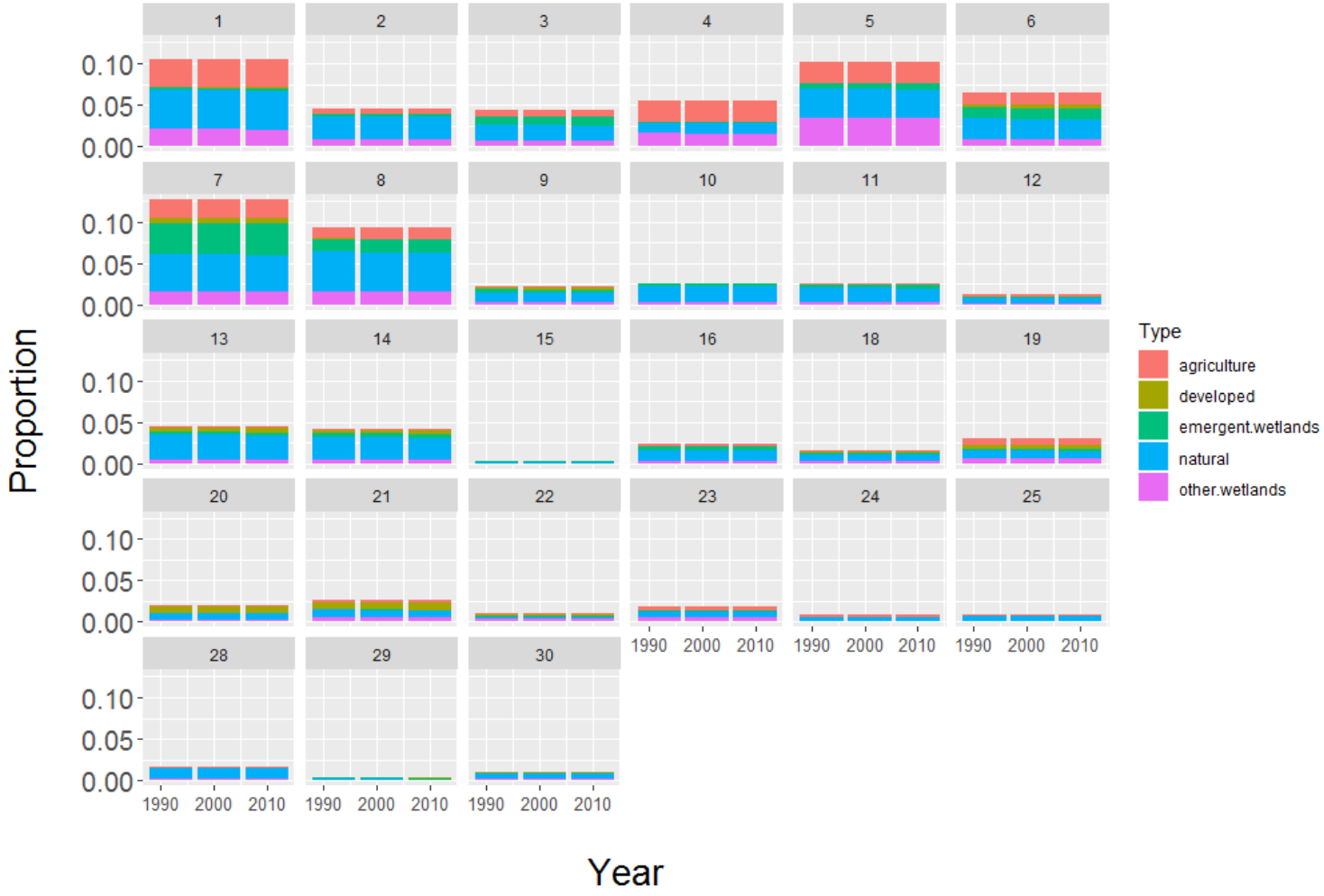


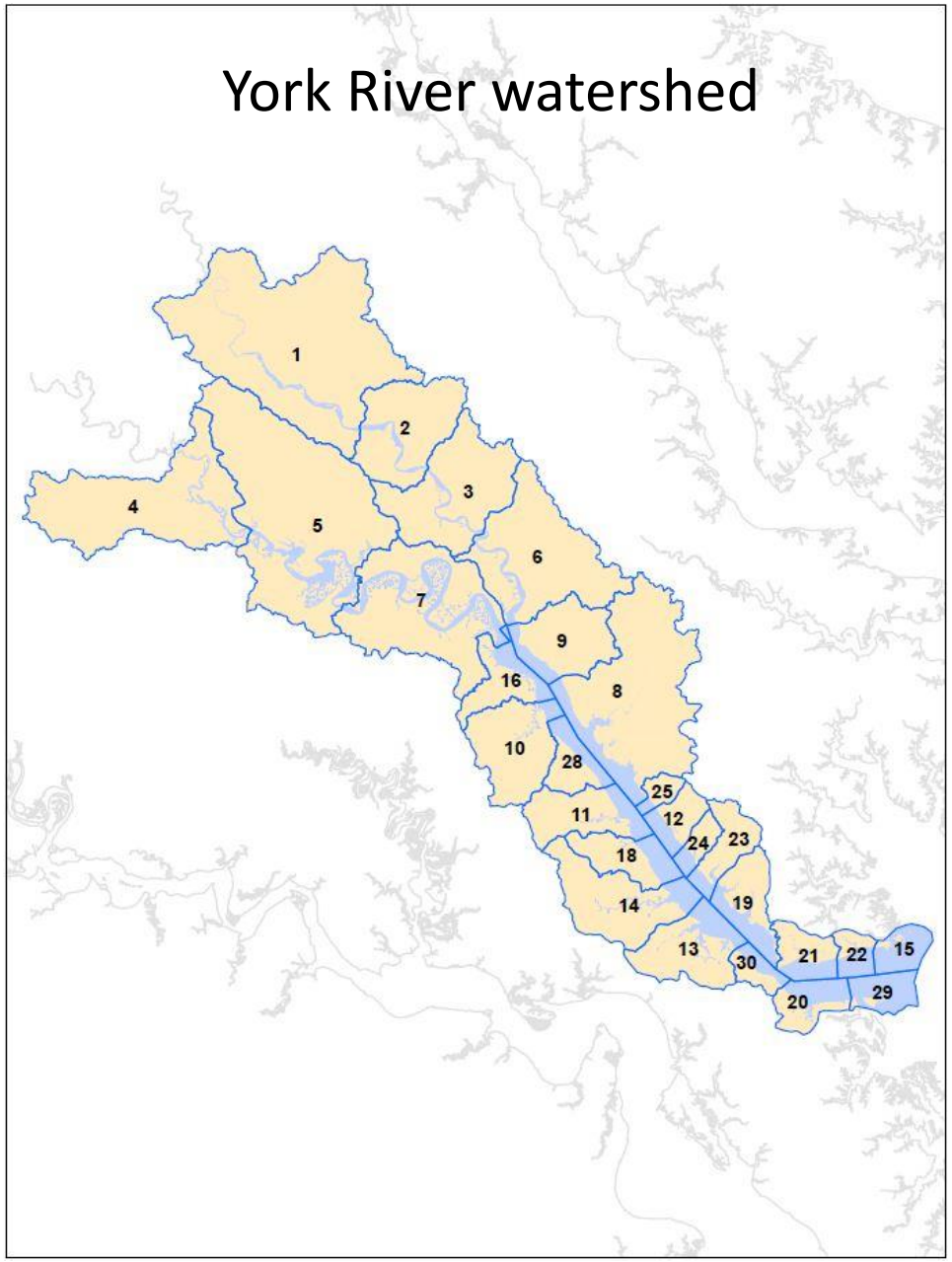



# Land use and shoreline characterization

- Subdivided the York River into subwatersheds
- Summarized the C-CAP data set and linearized changes (1000m)

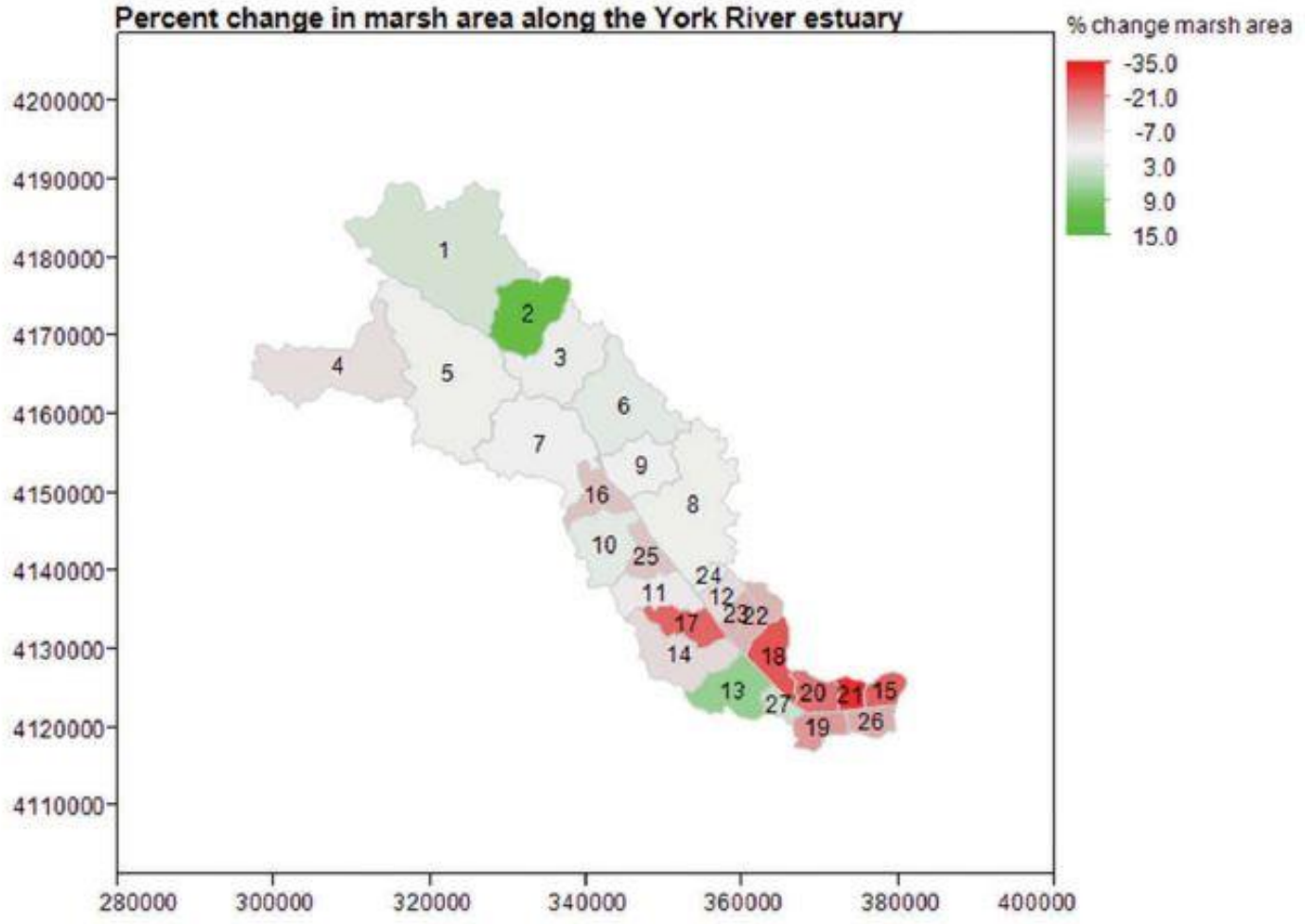


# Data sources:

- VIMS Center for Coastal Resources Management Shoreline Inventory, Tidal Marsh Inventory, and Permit Database – Develop an index of change for shorescapes (e.g., % armored, % marsh)

Tidal marsh inventory example




*X* and *y* coordinates are UTM eastings and northings

M. Mitchell, J. Herman, D. M. Bilkovic & C. Hershner (2017)

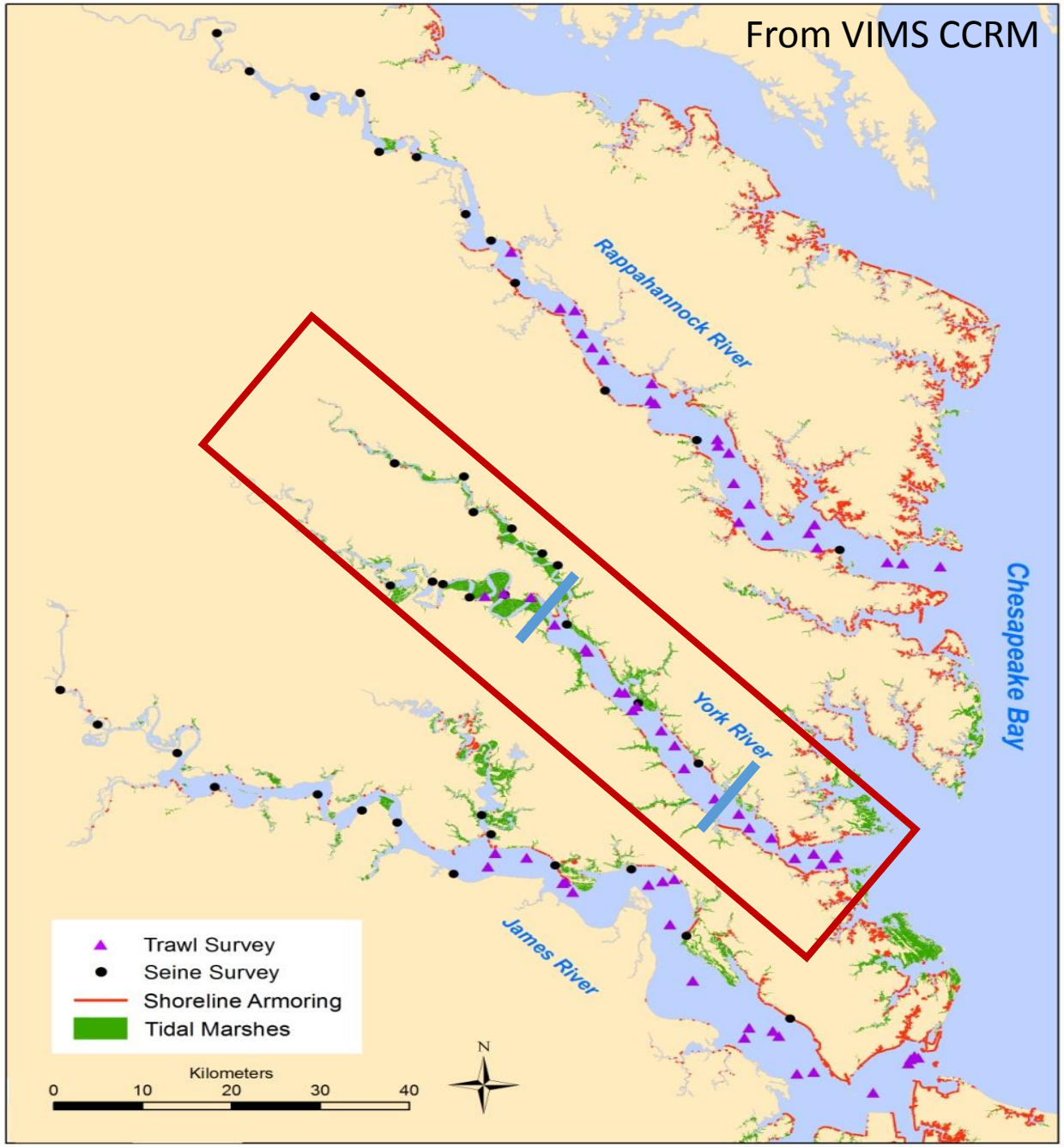
# Data sources:

- VIMS Juvenile Striped Bass Seine Survey (summer)
- VIMS Juvenile Fish Trawl Survey (monthly)

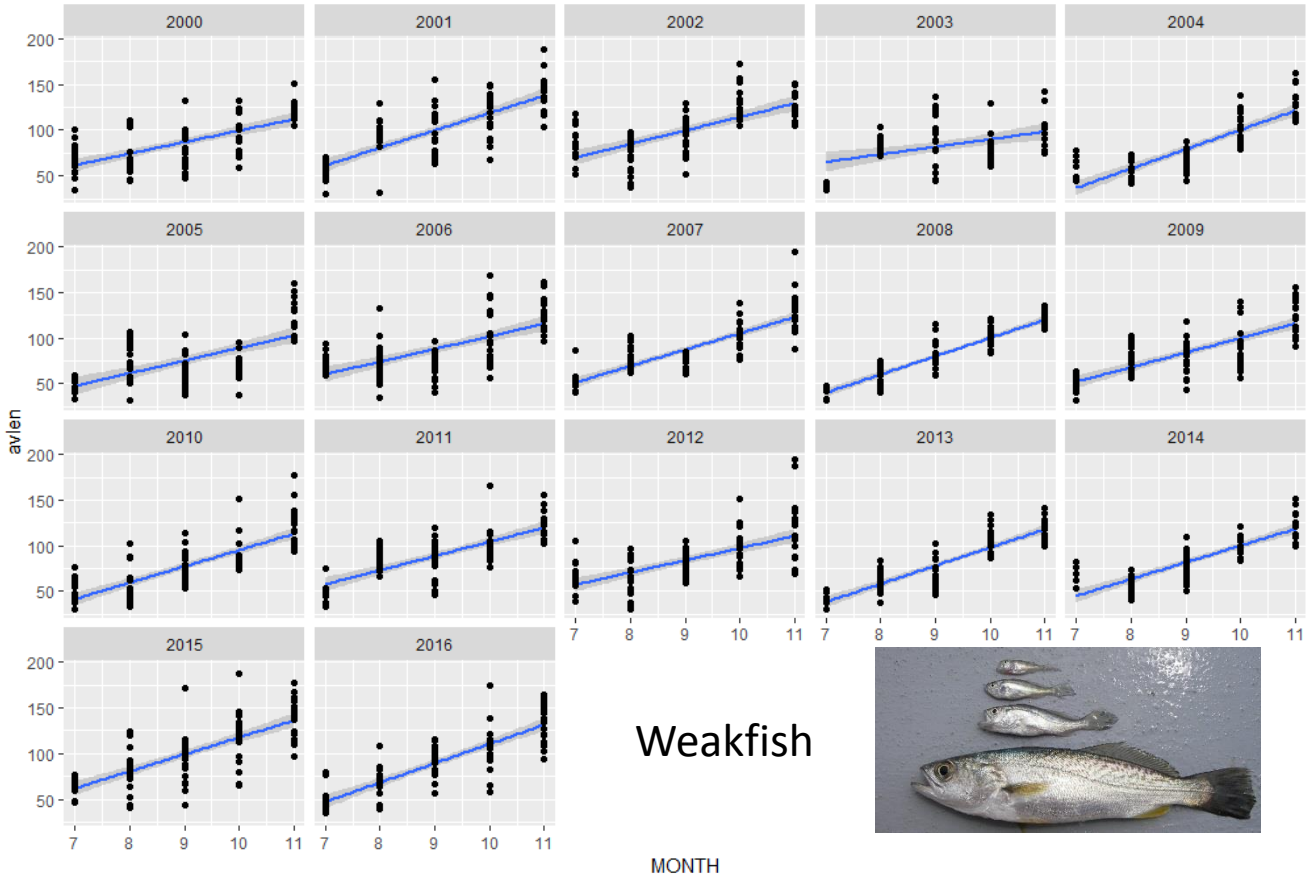
Develop metrics of forage quality (e.g., relative abundance, size, species composition)

Forage species:

Weakfish, Spot, Summer flounder, Bay anchovy, Atlantic croaker, Kingfish spp., Blue crab, Spotted hake, Blackcheek tonguefish, Banded killifish, Atlantic menhaden, Mummichog, Atlantic silversides, White perch (Ihde et al. 2015)



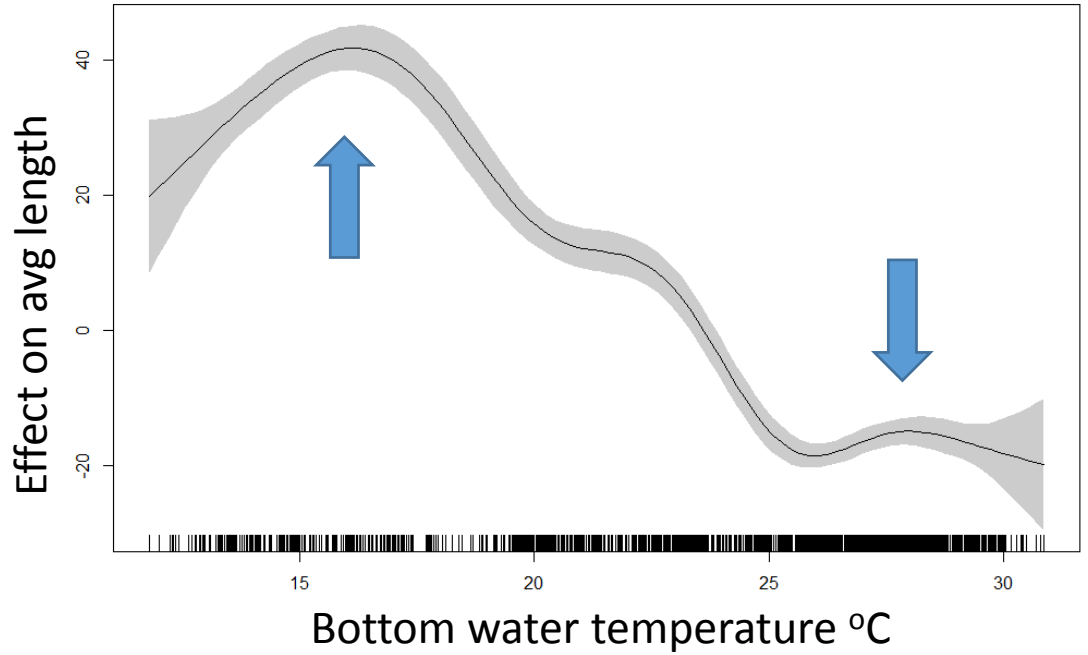
# Generalized additive models (GAMs): Weakfish example

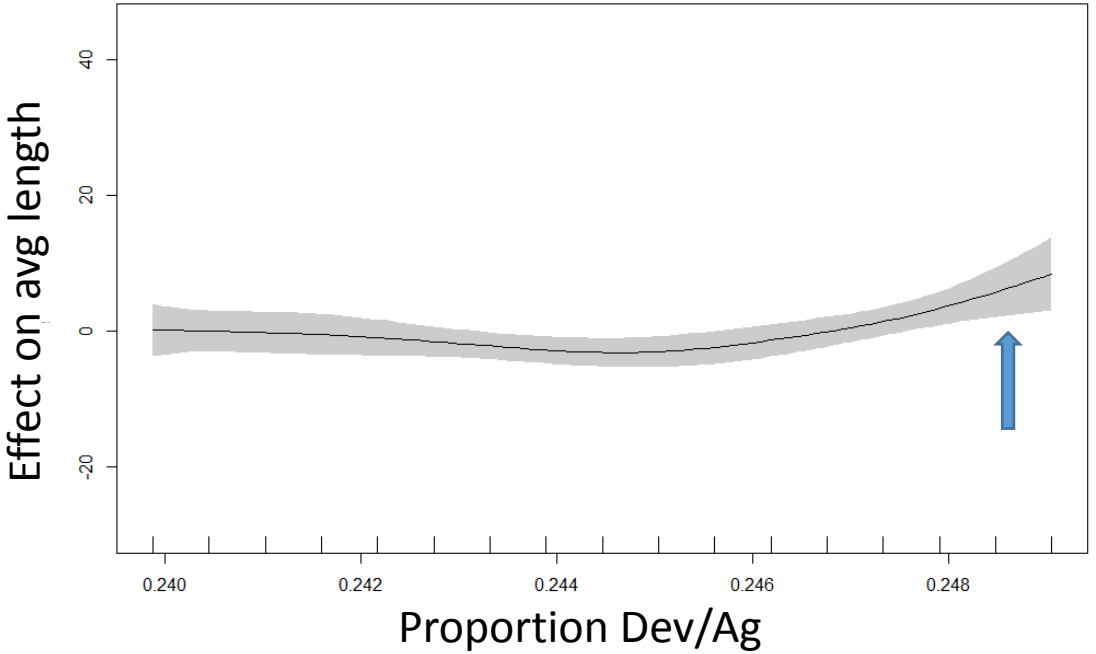



Weakfish



Data source: VIMS Juvenile Fish Trawl Survey



Thank you!
Questions?